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ABSTRACT OF THE DISCLSOURE

A mass spectrometer having an ion optics system in a first vacuum region, which diverts ions travelling in a first direction from a source, characterized by an initial pressure, through an angle such that neutral particles and photons from the source continue in the first direction and are removed. The diverted ion beam is then directed into a quadrupole mass analyzer arrangement in a second vacuum region, which comprises a set of fringe electrodes followed by a linear mass analyzer and then an ion detector. The first vacuum region is characterized by a pressure intermediate the initial pressure and a second vacuum region pressure. The set of quadrupole fringe electrodes are configured to divert the ion beam prior to passage of the ion beam into the linear quadrupole mass analyzer and to shield the linear quadrupole mass analyzer entrance from a substantial portion of the trajectory of the ion beam in the first vacuum region.